

Occupational activity across adult life and its association with grip strength

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Invited commentary for Occupational & Environmental Medicine on: 'Heavy manual work throughout the working lifetime and muscle strength among men at retirement age' Walker-Bone K et al

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Grip strength is a marker of upper body muscle strength commonly used in epidemiological studies.[1] Weaker grip strength from early adulthood onwards has been related to a wide range of subsequent health outcomes including higher mortality rates[2, 3] and increased risk of mobility disability[4] and chronic disease.[3, 5] In addition, muscle weakness is a key component of common age-related disorders including frailty and sarcopenia. Identifying modifiable factors across life associated with grip strength is thus important.

Evidence from intervention studies across the adult age range suggests that specific types of activity, namely resistance training, improve grip strength in the short term.[6, 7] However, what is less clear is whether the general population undertake the 'right' types and intensity of activity as part of their everyday lives to realise these benefits and whether these benefits are maintained in the longer term. As highlighted by Walker-Bone and colleagues in this issue of Occupational & Environmental Medicine,[8] one way in which it has been hypothesised that people may achieve such activity is through manual work; if this is so, then there are important public health implications given the secular decline in manual work.

Using data on the number of years across adult life that men within the Hertfordshire Cohort Study spent within the workplace standing/walking for ≥ 4 hours/day, lifting weights ≥ 25 kg and undertaking energetic activities sufficient to cause sweating, Walker-Bone and colleagues have been able to assess the cumulative associations of these different occupational activities with grip strength in early old age (mean age 65.8y).[8] Contrary to expectations, greater lifetime exposure to the occupational activities assessed were if anything modestly associated with weaker grip strength in this British cohort. However, this is consistent with findings from the few other studies that have relevant data on occupational histories and have assessed similar associations, including a large Danish cohort.[9]

Walker-Bone and colleagues suggest that their findings could be explained by the fact that any benefit gained from engaging in manual work, in terms of increased lifetime activity, may be outweighed by other factors associated with having a lower occupational class that are detrimental for health and functioning, such as poorer lifetime nutrition and higher levels of smoking. This seems plausible and is supported by the finding that the weak associations found between greater exposure to occupational activities and weaker grip strength were fully attenuated after adjustment for body size, occupational class and behavioural risk factors.

Although a strength of these new analyses is the availability of information on occupational activity across the whole of working life, Walker-Bone and colleagues rightfully acknowledge that error could have been introduced that may have biased results towards the null because this information was retrospectively recalled. In addition, it is plausible that other types of occupational activity not assessed in this study may have been differentially associated with grip strength.

Caution is required when inferring the implications of this study's findings because it focuses on older men, the majority of whom were no longer working and, whose grip strength had been assessed at just one time point. Another consideration is that the men in this study will have experienced different occupational exposures to younger born generations. Walker-Bone and colleagues suggest that this study's findings may help allay public health concerns about the increasing mechanisation of manual work and subsequent decline in population levels of occupational activity, at least with regards to strength. However, it remains plausible that occupational activities, such as those investigated in this study, are beneficial for muscle strength earlier in adulthood but that these benefits are not observed in later adulthood because of age-related increases in work-related injuries and 'wear and tear', the gradual accumulation of the negative effects of other factors that counteract the potentially beneficial effects of these occupational activities or because the benefits are transient and are only maintained while the activity is being undertaken regularly. Each of these potential explanations has slightly different implications. For example, if there were benefits of occupational activity earlier in adulthood, the findings from this study would imply that men in manual occupations are at greater risk of grip strength decline through midlife and early old age.

To gain further insight into these associations and their public health implications, additional studies are thus ideally required that examine: 1) whether the associations of different occupational activities with grip strength vary by age and gender across adulthood; 2) whether associations at any one particular age vary by birth cohort and; 3) whether different occupational activities are associated with within-individual changes in grip strength across adult life. With this additional information we would be in a stronger position to identify how best to intervene to ensure people maintain adequate muscle strength in later life and to assess whether specific occupational groups may require more support than others to achieve this.

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Conflicts of interest:

None to declare.

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